Tactical Combat Casualty Care

Tactical Evacuation Care

OBJECTIVES

DESCRIBE the differences between MEDEVAC and CASEVAC

DESCRIBE the differences between Tactical Field Care and Tactical Evacuation Care

DESCRIBE the additional assets that may be available for airway management and electronic monitoring

DISCUSS the indications for and administration of Tranexamic Acid during tactical evacuation

OBJECTIVES

DISCUSS the management of moderate/severe TBI during tactical evacuation

DESCRIBE additional options that may be available in TEC for resuscitation from hemorrhagic shock

LIST the indications and administrative controls applicable to giving blood component therapy and fresh whole blood in the field

Tactical Evacuation

Casualties need evacuation as soon as feasible after significant injuries.

Evacuation asset may be a ground vehicle, aircraft, or boat.

Evacuation time is highly variable – significant delays may be encountered.

Tactical situation and hostile threat to evacuation platforms may differ markedly from one casualty scenario to another.

The Tactical Evacuation phase allows for additional medical personnel and equipment to be used.

Evacuation Terms

- **MEDEVAC**: evacuation using special dedicated medical assets marked with a Red Cross
  - MEDEVAC platforms are non-combatant assets

- **CASEVAC**: evacuation using non-medical platforms
  - May carry a Quick-Reaction force and provide close air support as well

- **Tactical Evacuation (TACEVAC)** – this term encompasses both types of evacuation above

Aircraft Evacuation Planning

- Flying rules vary widely among different aircraft and units
- Consider:
  - Distances and altitudes involved
  - Day versus night
  - Passenger capacity
  - Hostile threat
  - Medical equipmer
  - Medical personne
  - Icing conditions

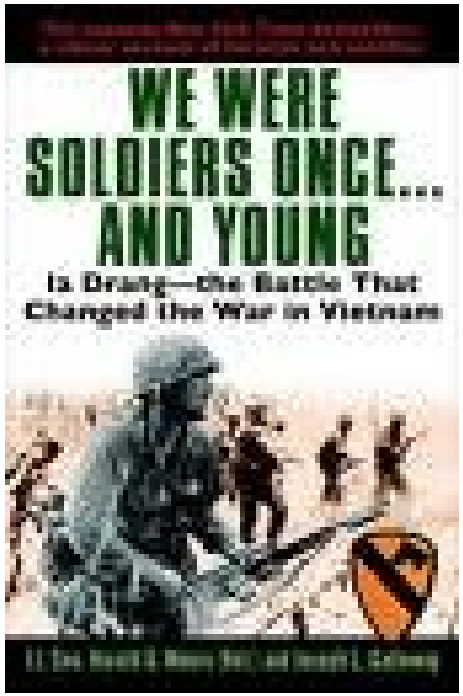
Aircraft Evacuation Planning

- Ensure that your evacuation plan includes aircraft capable to fly the missions you need

- Plan for primary, secondary, tertiary options

MEDEVAC vs CASEVAC: The Battle of the Ia Drang Valley

- 1st Bn, 7th Cavalry in Vietnam
- Surrounded by 2000 NVA - heavy casualties.
- Called for MEDEVAC.
- Request refused because landing zone. was not secure.
- Eventual pickup by 229th Assault Helo Squadron after long delay.
- Soldiers died because of this mistake.



Ground Vehicle Evacuation

- More prevalent in urban-centric operations in close proximity to a medical facility.
- May also be organic to unit or designated MEDEVAC assets.

Tactical Evacuation Care

- TCCC guidelines for care are largely the same in TACEVAC as for Tactical Field Care.
- There are some changes that reflect the additional medical equipment and personnel that may be present in the TEC setting.
- This section will focus on those differences.

Airway Management in TACEVAC

- Additional Options for Airway Management
  - Supraglottic airway
  - Endotracheal Intubation

- Confirm ETT placement with CO2 monitoring

- These airways are advanced skills not taught in basic TCCC course.

Breathing in TACEVAC

- Watch for tension pneumothorax as casualties with a chest wound ascend into the lower pressure at altitude
- Pulse ox readings will become lower as casualty ascends unless supplemental oxygen is added
- Chest tube placement may be considered if a casualty with suspected tension pneumothorax fails to respond to needle decompression

Supplemental Oxygen in Tactical Evacuation Care

- Most casualties do not need supplemental oxygen, but have oxygen availab
  for:
  - Casualties in shock
  - Low oxygen sat on pulse ox
  - Unconscious casualties
  - Casualties with TBI
    (maintain oxygen saturation
  - Chest wound casualties

Tranexamic Acid (TXA)

Tranexamic Acid (TXA)

- If a casualty is anticipated to need significant blood transfusion (for example: presents with hemorrhagic shock, one or more major amputations, penetrating torso trauma, or evidence of severe bleeding)
- Administer 1 gram of Tranexamic acid (TXA) in 100 cc Normal Saline or Lactated Ringer's as soon as possible but NOT later than 3 hours after injury.
- Begin second infusion of 1 gm TXA after Hextend or other fluid treatment.

TXA Administration – 2nd Dose

- Typically given after the casualty arrives at a Role II/Role III medical facility.
- May be given in Tactical Evacuation Care if the first dose was given earlier, and fluid resuscitation has been completed before arrival at the medical facility.
- Should **NOT** be given with Hextend or through an IV line with Hextend in it.
- Inject 1 gram of TXA into a 100-cc bag of Normal saline or lactated ringer's.
- Infuse slowly over 10 minutes.

Tactical Evacuation Care

- Traumatic Brain Injury

- Casualties with moderate/severe TBI should be monitored for:
  - Decreases in level of consciousness
  - Pupillary dilation
  - SBP should be >90 mmHg
  - O2 sat > 90

Tactical Evacuation Care

- Traumatic Brain Injury

- Casualties with moderate/severe TBI should be monitored for:
  - Hypothermia
  - PCO2 (If capnography is available, maintain between 35-40 mmHg)
  - Penetrating head trauma (if present, administer antibiotics)
  - Assume a spinal (neck) injury until cleared

Tactical Evacuation Care

- Traumatic Brain Injury

- Casualties with moderate/severe TBI should be monitored for:
  - Unilateral pupillary dilation accompanied by a decreased level of consciousness may signify impending cerebral herniation; if these signs occur, take the following actions to decrease intracranial pressure:
  - Administer 250cc of 3% or 5% hypertonic saline bolus
  - Elevate the casualty's head 30 degrees

Tactical Evacuation Care

- Traumatic Brain Injury

- Casualties with moderate/severe TBI should be monitored for:
  - Hyperventilate the casualty
  - Respiratory rate 20
  - Capnography should be used to maintain the end-

  tidal CO2 between 30-35 mmHg
  - The highest concentration (FIO2) possible should

  be used for hyperventilation

Tactical Evacuation Care

- Traumatic Brain Injury
- Notes:
  - Do not hyperventilate unless signs of impending herniation are present.
  - Casualties may be hyperventilated with oxygen using the bag-valve-mask technique.

Fluid Resuscitation in TACEVAC

- Fluid Resuscitation
- Reassess for hemorrhagic shock (altered mental status in the absence of brain injury and/or change in pulse character). If BP monitoring is available, maintain target systolic BP 80-90 mmHg
  - If **NOT** in shock:
    - No IV fluids necessary
    - PO fluids permissible if conscious and can swallow
  - If in shock and blood products are **NOT** available:
    - Hextend 500-mL IV bolus
    - Repeat after 30 minutes if still in shock
    - Continue resuscitation with Hextend or crystalloid solution as needed to maintain target BP or clinical improvement

Fluid Resuscitation in TACEVAC

- Fluid Resuscitation

- If in shock and blood products are available under an approved command or theater protocol:
  - Resuscitate with 2 units of plasma followed by packed red blood cells (PRBCs) in a 1:1 ratio. If blood component therapy is not available, transfuse fresh whole blood. Continue resuscitation as needed to maintain target BP or clinical improvement.
  - If a casualty with an altered mental status due to suspected TBI has a weak or absent peripheral pulse, resuscitate as necessary to maintain a palpable radial pulse. If BP monitoring is available, maintain target systolic BP of at least 90 mmHg.

Blood Product Administration

The success of blood product administration in improving the survival of trauma patients is unquestioned, and blood products are the standard for hospital-based trauma care in both military and civilian settings.

Blood Product Administration

The additional benefit gained from starting blood products in the pre-hospital phase has not yet been established in the medical literature, but the Defense Health Board has agreed that this therapy may be beneficial in the pre-hospital setting if blood products are available.

Blood Product Administration

Blood product administration should be initiated feasible for any casualty who meets protocol criteria and is **STILL ENROUTE** to the medical treatment facility.

There is no minimum transport time below which blood product therapy should not be initiated if protocol criteria are met.

Casualties who have absent radial pulse and/or decreased mental status due to hemorrhagic shock in the pre-hospital setting have a very high mortality rate and are in need of blood products as soon as possible.

Blood Transfusion Protocols

- Transfusion of blood products should **NOT** be attempted in the absence of a theater- or command-approved protocol

- Blood products should be transfused **ONLY** by providers that have been appropriately trained in the governing protocol

Damage Control Resuscitation

Standard of care for severe shock is now “1:1” therapy:

- One unit of plasma for every unit of packed red cells
- Different from previous focus primarily on packed red cells
- Plasma helps to control hemorrhage by promoting clotting
- Has been shown to increase survival

Protocols for FDA-Compliant Blood Products (Component Therapy)

- Issues to address :
  - Minimum provider level required
  - Training in blood product administration
  - Preparation and transport of blood products
  - Transfusion equipment
  - Which casualties need blood products
  - Verifying correct blood type

Protocols for FDA-Compliant Blood Products (Component Therapy)

- Issues to address include (cont.):
  - Which products should be given and how much
  - Transfusion procedures
  - Management of transfusion reactions
  - Documentation of blood product administration

Non - FDA Compliant Blood Products
Fresh Whole Blood (FWB)

- Must be administered IAW Assistant Secretary of Defense for Health Affairs memo of 19 March 2010

- Used only in emergencies when:
  - No FDA-compliant blood products are available
  - Complying with a command-approved protocol
  - Providers trained in the protocol

- Transfusing FWB may save lives when blood components are not available

Protocols for Non-FDA Compliant Blood Products

- Issues to address include:
  - Minimum provider level required
  - Training in FWB administration
  - Transfusion equipment
  - Which casualties need FWB
  - Prescreened donor pool
  - Screening for infectious agents
  - Verifying blood type
  - Transfusion procedures

Protocols for Non-FDA Compliant Blood Products

- Issues to address (cont.):
  - How much FWB should be given
  - Management of transfusion reactions
  - Documentation of blood product administration
  - Post-transfusion monitoring of donor and recipient

Hypothermia Prevention in TACEVAC

- Remember to keep the casualty on an insulated surface or get him/her on one as soon as possible

- Apply the Ready-Heat Blanket from the Hypothermia Prevention and Management Kit (HPMK), to the casualty's torso (not directly on the skin) and cover the casualty with the Heat-Reflective Shell (HR

Hypothermia Prevention in TACEVAC

If an HRS is not available, the previously recommended combination of the Blizzard Survival Blanket and the Ready Heat blanket may also be used.

Use a portable fluid warmer capable of warming all IV fluids including blood products.

Prevent Hypothermia in Helicopters!

- Cabin wind and altitude could result in cold stress.

- Protection is especially important for burn casualties and casualties in shock

CPR in Tactical Evacuation Care

- Casualties with torso trauma or polytrauma with no pulse or respirations during TACEVAC, should have a bilateral needle decompression performed to ensure there is no tension pneumothorax.

- CPR may be attempted during this phase of care if the casualty does not have obviously fatal wounds and will be arriving at a facility with a surgical capability within a short period of time. CPR should not be done at the expense of compromising the mission or denying lifesaving care to other casualties.

TACEVAC CARE: Hoisting

- **Rigid Litters Only** When Hoisting!
- Check and double-check rigging

Preparing for Evacuation

NATO/ISAF Standard Evacuation Categories

International Security Assistance Force SOP #312:

- Governs operations in Afghanistan
- Follows NATO doctrine
- Specifies three categories for casualty evacuation:
  - **A - Urgent**
  - **B - Priority**
  - **C - Routine**

NATO/ISAF Standard Evacuation Categories

- **CAT A – Urgent (denotes a critical, life-threatening injury)**
  - Significant injuries from a dismounted IED attack
  - Gunshot wound or penetrating shrapnel to chest, abdomen or pelvis
  - Any casualty with ongoing airway difficulty
  - Any casualty with ongoing respiratory difficulty
  - Unconscious casualty

NATO/ISAF Standard Evacuation Categories

- **CAT A – Urgent** (continued)
  - Casualty with known or suspected spinal injury
  - Casualty in shock
  - Casualty with bleeding that is difficult to control
  - Moderate/Severe TBI
  - Burns greater than 20% Total Body Surface Area

  - **URGENT MEANS PT IS IN DANGER OF LOSING LIFE, LIMB, OR EYESIGHT**

NATO/ISAF Standard Evacuation Categories

- **CAT B – Priority (serious injury)**
  - Isolated, open extremity fracture with bleeding controlled
  - Any casualty with a tourniquet in place
  - Penetrating or other serious eye injury
  - Significant soft tissue injury without major bleeding
  - Extremity injury with absent distal pulses
  - Burns 10-20% Total Body Surface Area

NATO/ISAF Standard Evacuation Categories

- **CAT C – Routine (mild to moderate injury)**
  - Concussion (mild TBI)
  - Gunshot wound to extremity - bleeding controlled **without** tourniquet
  - Minor soft tissue shrapnel injury
  - Closed fracture with intact distal pulses
  - Burns < 10% Total Body Surface Area

NATO/ISAF Standard Evacuation Categories

- Remember:
  - You can always go up in category but never go down
  - If you’re unsure whether or not a PT is urgent, they are

Tactical Evacuation: Nine Rules of Thumb

TACEVAC
9 Rules of Thumb: Assumptions

- The Rules of Thumb are designed to help the corpsman or medic determine the true urgency for evacuation.
- They assume that the decision is being made at 15-30 minutes after wounding.
- Most important when there are tactical constraints on evacuation:
  - Interferes with mission
  - High risk for team
  - High risk for TACEVAC platform

TACEVAC Rule of Thumb #1

Soft tissue injuries are common and may look bad, but usually don’t kill unless associated with shock

TACEVAC Rule of Thumb #2

Bleeding from most extremity wounds should be controllable with a tourniquet or hemostatic dressing. Evacuation delays should not increase mortality if bleeding is fully controlled.

TACEVAC Rule of Thumb #3

Casualties who are in shock should be evacuated as soon as possible

(Gunshot wound to the abdomen)

TACEVAC Rule of Thumb #4

Casualties with penetrating wounds of the chest who have respiratory distress unrelieved by needle decompression of the chest should be evacuated as soon as possible

TACEVAC Rule of Thumb #5

- Casualties with blunt or penetrating trauma of the face associated with airway difficulty should have an immediate airway established and be evacuated as soon as possible.

- REMEMBER to let the casualty sit up and lean forward if that helps them to b !

TACEVAC Rule of Thumb #6

Casualties with blunt or penetrating wounds of the head where there is obvious massive brain damage and unconsciousness are unlikely to survive **with or without** emergent evacuation

TACEVAC Rule of Thumb #7

Casualties with blunt or penetrating wounds to the head, where the skull has been penetrated but the casualty is conscious - should be evacuated emergently.

TACEVAC Rule of Thumb #8

Casualties with penetrating wounds of the chest or abdomen who are not in shock at their 15-minute evaluation have a moderate risk of developing late shock from slowly bleeding internal injuries. They should be carefully monitored and evacuated as feasible

TACEVAC Rule of Thumb #9

Casualties with TBI who display “red flag” signs - witnessed loss of consciousness, altered mental status, unequal pupils, seizures, repeated vomiting, visual disturbance, worsening headache, unilateral weakness, disorientation, or abnormal speech – require urgent evacuation to a medical treatment facility.

9-Line Evacuation Request

- Request for resources through tactical aircraft channels.
- Communication is conversational in nature but it is **NOT** with someone who knows medical jargon.
- Significance
  - Determines tactical resource allocation
  - **DOES NOT** convey much useful medical information

9-Line Evacuation Request

Line 1: Pickup location

Line 2: Radio frequency, call sign and suffix

Line 3: Number of casualties by precedence (evacuation category)

Line 4: Special equipment required (Respirator, blood products, oxygen, advanced airways, hoist etc.)

9-Line Evacuation Request

Line 5: Number of casualties by type (litter OR ambulatory)

Line 6: Security at pickup site

Line 7: Method of marking pickup site

Line 8: Casualty's nationality and status

Line 9: Terrain Description; NBC contamination

9 Line CASEVAC Request Example

“Apache main this is Apache 1-3 actual”

“Go for main”

“Standby for 9 line”

“Standing by”

“Line one: 61348752”

“Line two: this freq, Apache 1-3 actual”

“Line three: three urgent”

“Break” (Breaks usually given every three lines)

“Line four: ventilator”

“Line five: two litter, one ambulatory”

9 Line CASEVAC Request Example

“Line six: enemy 150 meters to the South”

“Line seven: LZ marked by smoke” (Color not given until bird can visualize and confirm)

“Line eight: three US Military”

“Line nine: open meadow approximately 100m by 100m, power lines to the East, ingress from the North, egress to the West.

“How copy?”

> “Main copies all. Be advised bird is 45 mikes out.”

“Solid copy”

MIST Report

- The MIST report and Zap number may be given before or after the 9-line, dependent on your unit SOP

- MIST:
  - **Mechanism of Injury** (GSW, RPG, IED, etc.)
  - **Injuries sustained** (Bilateral leg amputation, penetrating trauma to the face etc.)
    - Give this in PMARCHP order so that nothing is missed
  - **Signs & Symptoms** (BP, respiratory rate, HR etc.)
  - **Treatments rendered** (Right arm splinted, TQs applied to both legs etc.)

Again, give this in PMARCHP order so that nothing is missed

Zap or “Kill” Number

- Usually given before the MIST Report
- Is a quick way to give vital information as to the identity of the injured during radio communication
- Unit SOP dependent but usually a combination of:
  - Company (A, B, W, etc.)
  - First letter or some portion of last name
  - Last four of Social (May be DoD ID)
  - Blood type
- EXAMPLE: For John Smith of Weapons co., social 555-55-1234, and blood type O+:
  - WS1234 O+

Tactical Evacuation Care Summary of Key Points

- Evacuation time is highly variable
- Thorough planning is key
- Similar to Tactical Field Care guidelines but some modifications

Preparing for Evacuation
Summary of Key Points

- Evacuation Categories
- Tactical Evacuation Rules of Thumb
- 9-Line Evacuation Request
- Zap and MIST

Questions?

Management of Wounded Hostile Combatants

Objectives

- DESCRIBE the considerations in rendering trauma care to wounded hostile combatants.

Care for Wounded Hostile Combatants

- No medical care during Care Under Fire
- Though wounded, enemy personnel may still act as hostile combatants
  - May employ any weapons or detonate any ordnance they are carrying
- **Enemy casualties are *hostile combatants* until they:**
  - **Indicate surrender**
  - **Drop all weapons**
  - **Are proven to no longer pose a threat**

Care for Wounded Hostile Combatants

- **Combat medical personnel should not attempt to provide medical care until sure that wounded hostile combatant has been rendered safe by other members of the unit.**
- Restrain with flex cuffs or other devices if not already done.
- Search for weapons and/or ordnance.
- Silence to prevent communication with other hostile combatants.

Care for Wounded Hostile Combatants

- Segregate from other captured hostile combatants.
- Safeguard from further injury.
- **Care as per TFC guidelines for U.S. forces after above steps are acc**
- Speed to the rear as medica and tactically feasible

TACEVAC Care for Wounded Hostile Combatants

- Principles of care are the same for all wounded combatants
- Rules of Engagement may dictate evacuation process
- Restrain and provide security
- Remember that each hostile casualty represents a potential threat to the pr and the unit and take appropriate mea
- **They still want to kill you.**

QUESTIONS ?

Questions/Comments